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Notice of Allowability	Application No.	Applicant(s)	
	09/870,393	LU, ZHIMIN	
	Examiner	Art Unit	
	Evan Pert	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--
 All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the election filed February 11, 2005.
2. ☒ The allowed claim(s) is/are 1-45.
3. ☒ The drawings filed on 02 July 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>1001, 0102, 0903</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows:

At page 6, line 13, after "robot origin," insert --228--.

At p. 10, line 2, change "sensors parallel" to --sensors are parallel--.

In claim 25, last line, change "by sensor" to --by the sensor--.

Enter the preliminary amendment filed 8-6-02, changing "reference wafer" to --reference substrate—, in claims 17 and 19-23.

Information Disclosure Statement

2. Applicant's IDS papers cited references not entirely in English. The examiner considered the references in the form as submitted, using English abstracts and/or figures for determination of relevance to patentability of the pending claims. Only English portions of text were considered.

Election/Restrictions

3. Applicant's election without traverse of method claims 1-23 and 25-45 is acknowledged. However, the election is moot as the restriction is hereby withdrawn.

Allowable Subject Matter

4. Claims 1-45 are allowed.

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5. The following is an examiner's statement of reasons for allowance:

Regarding claim 24, the prior art does not disclose applicant's claimed system for accurately positioning a workpiece, such as a semiconductor wafer:

The claimed system can be distinguished from prior art by the system including "at least two proportionate sensors aligned parallel to one another, each sensor producing an output inversely proportional to a sensor beam area blocked by the workpiece" (i.e. claim 24 exemplified by Fig. 6), with "aligned parallel to one another" implicitly meaning that the sensing beam (sensing *sensor*) areas are aligned parallel, in view of the written description of the specification.

Regarding claims 1-23, the prior art does not disclose applicant's claimed method of accurately positioning a substrate within a semiconductor processing apparatus, as supported by the written description of the specification, characterized by the way in which "reference substrate data" is recorded from a sensor while a "reference substrate" (e.g. a manually centered semiconductor wafer) is at a nominal position, to then have calculation of and compensation for drift is subsequent robot movement, enabled by an exemplary system as set forth in claim 24.

Regarding claims 25-45, the prior art does not disclose applicant's method of orienting, as supported by the written description, the method being particularly applicable to orienting "two proportionate sensors" to be "aligned parallel to one another" as in claim 24:

The claimed methodology for orienting (i.e. claims 25-45) can be broadly distinguished from prior art by the placing of a sensor in an initial orientation (e.g. a rough guess), moving a substrate to be sensed to a plurality of locations and collecting data at the locations, and adjusting the sensor from the initial orientation based upon the data collected by the sensor.

Applicant's invention for accurately positioning a substrate such as a wafer is advantageous for various reasons, such as being "reliable" and "easily retrofitted" into existing wafer processing equipment [e.g. see p. 20, lines 10-24].

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The patents to Mooring et al. (US 6,502,054) and Mitchell et al. (US 6,690,986) are cited for disclosing systems and methods for alignment of semiconductor wafers using optical sensors, including dynamic alignment taught by Mooring et al., yet the references do not suggest claimed features of applicant's invention such as the parallel alignment of a least two sensors (i.e. at least two parallel areas for sensing), such as in allowed claim 24, the "reference substrate" of allowed claims 1-23 or the moving of sensors based on data from the sensors of allowed claims 25-45, for example.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Evan Pert whose telephone number is 571-272-1969. The examiner can normally be reached on M-F (7:30AM-3:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ETP
May 2, 2005


EVAN PERT
PRIMARY EXAMINER